

Center for Integrated Nanotechnologies

Sandia National Laboratories • Los Alamos National Laboratory



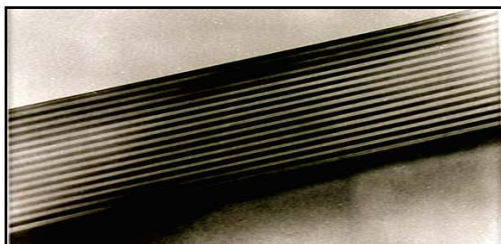
- Highly collaborative DOE National User Facility
- Focused on nanoscience and its integration across scientific disciplines and multiple length scales.
- Open access to tools and expertise to explore the continuum from scientific discovery to the integration of nanostructures into the micro and macro worlds.

“One scientific community focused on nanoscience integration”

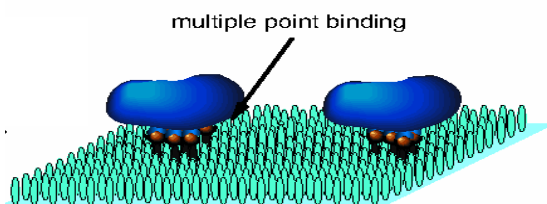


Integrated Nanotechnology will impact our world.

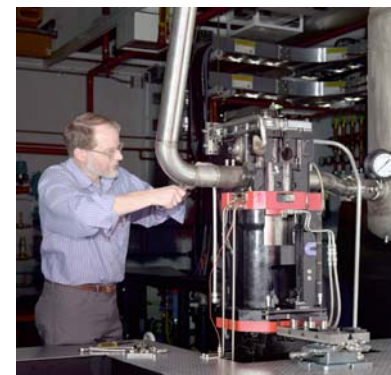
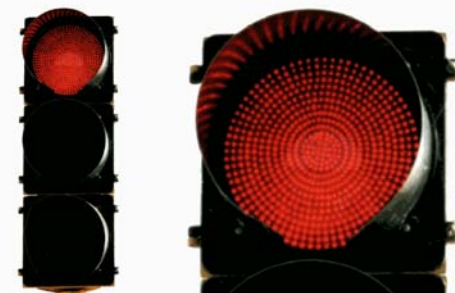
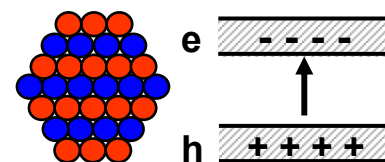
Energy



Security



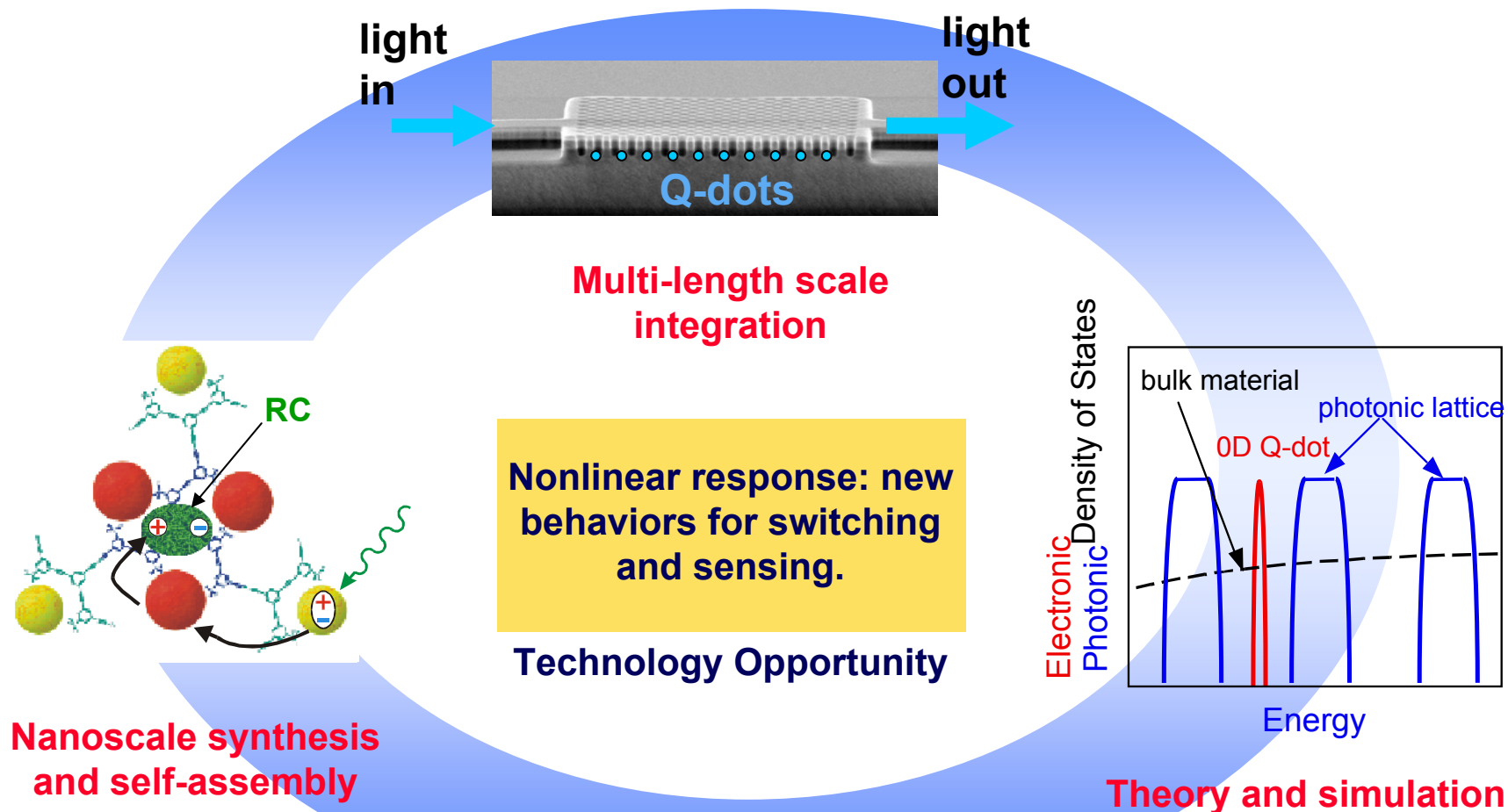
Environment



Connecting scientific disciplines and multiple length-scales is key to success

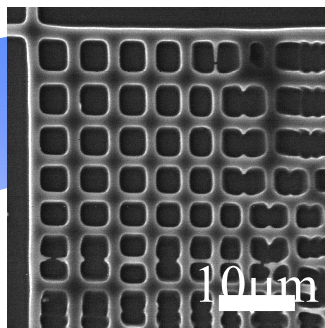


Integration Science Challenge: Energy transfer across multiple length scales

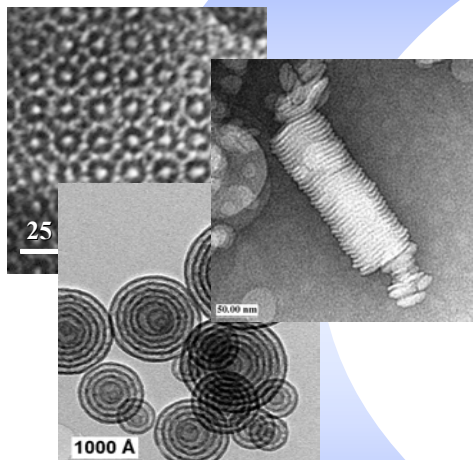




Integration Science Challenge: Combine top-down and bottom-up assembly



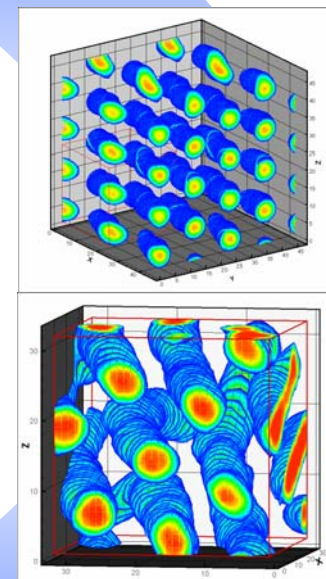
Microscale Templates



Molecular Assembly

**New functions from
complex and hierarchical
materials/devices**

Technology Opportunity



**Directed Assembly
and ordering**



Integration Science Challenge: Interfacing biological and synthetic systems

**From: Alberts et al. (1998)
"Essential Cell Biology."*

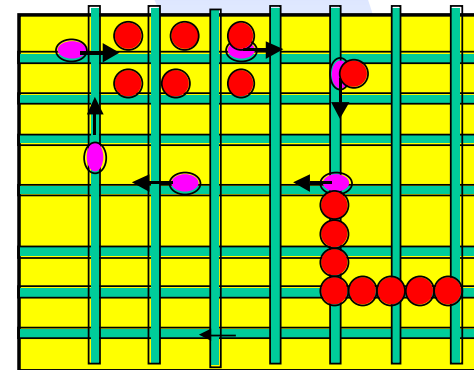
QuickTime™ and a Cinepak decompressor are needed to see this picture.



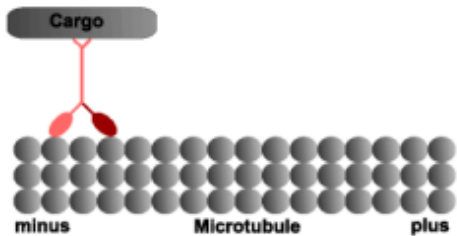
New Materials

**Active assembly, healing,
repair, reconfiguration,
adaptation**

Technology Opportunity



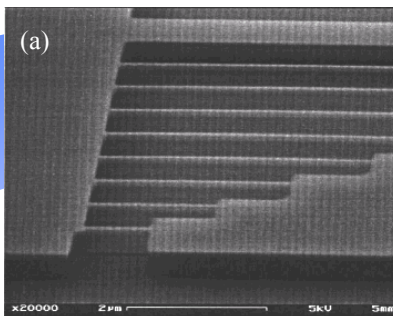
**Thermodynamic/Kinetic
Models**



Active Assembly



Integration Science Challenge: Mechanical force and fluid transport



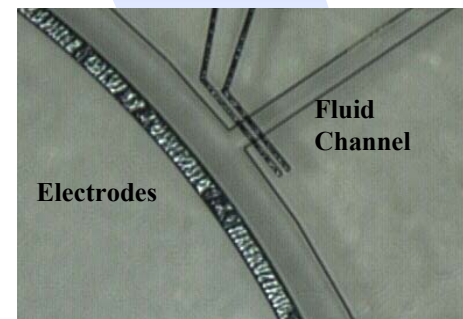
Nano-Mechanics



Molecular Machines

**Sort, actuate, sense
molecular and biological
materials and systems**

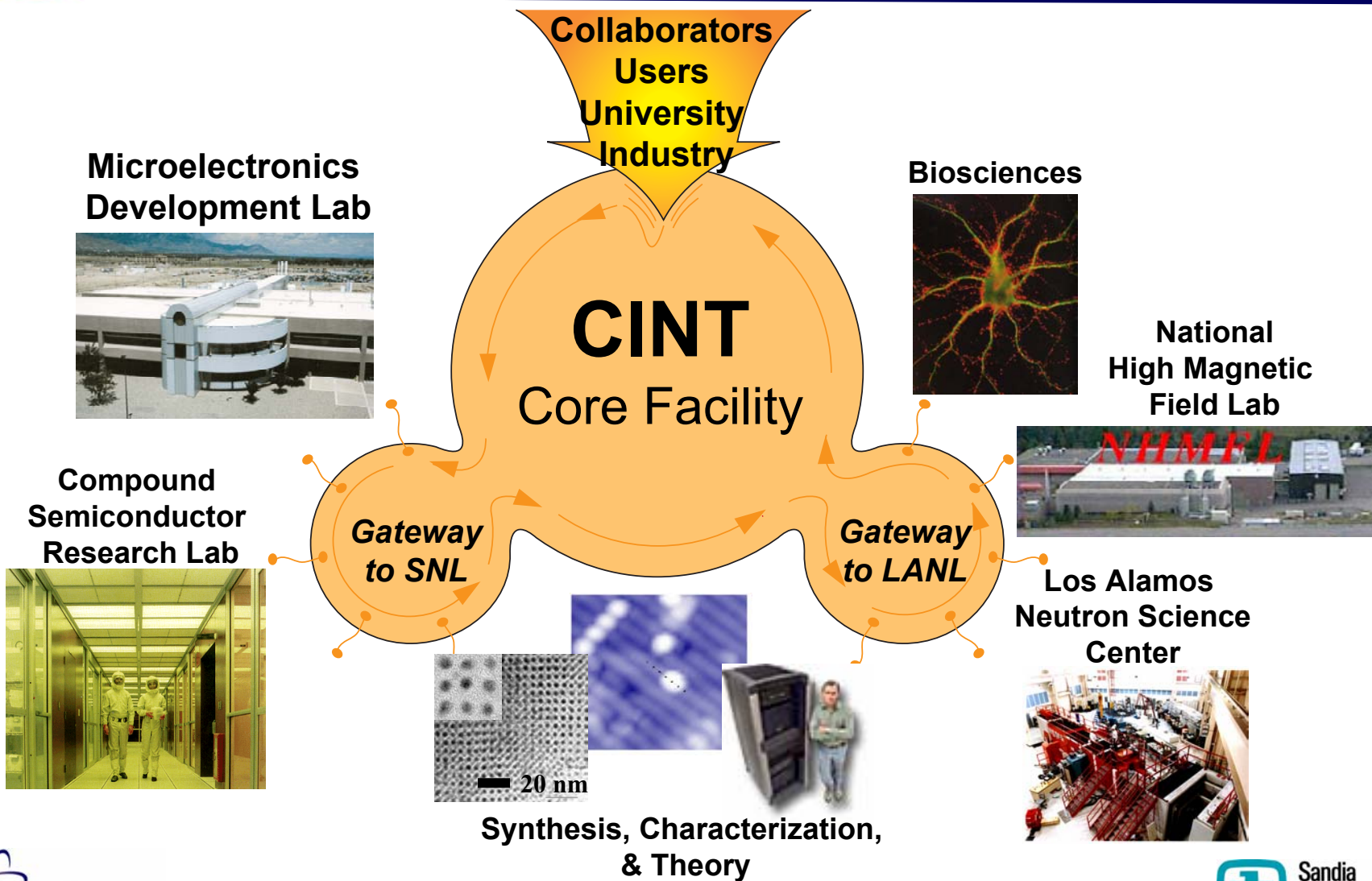
Technology Opportunity



Nano-Fluidics



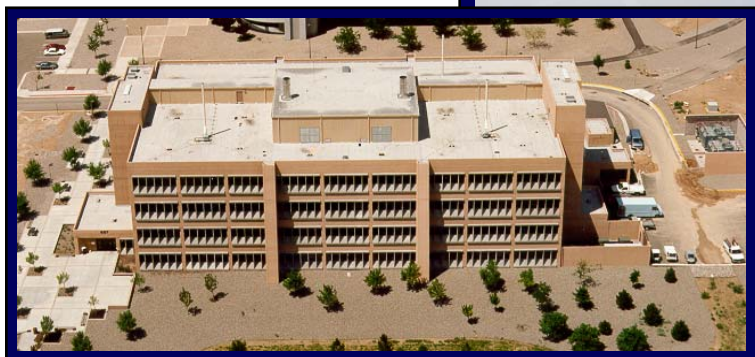
One community focused on nanoscience integration



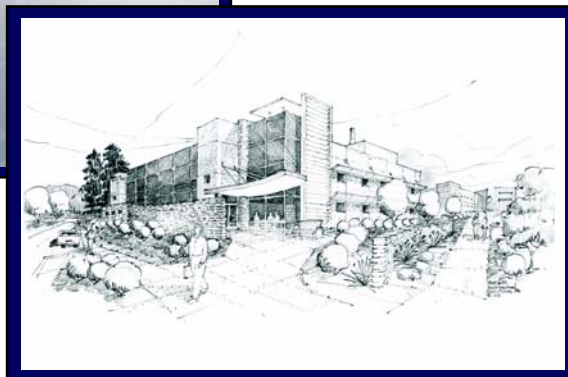


The CINT Core/Gateway model embodied with physical user facilities.

Core Facility in Albuquerque



**CINT Gateway to Sandia
Nanomaterials/Microfabrication**



**CINT Gateway to Los Alamos
Nanomaterials/Biosciences**



CINT Outreach and User Program

Open to all Research Sectors

- University
- Industry
- Government
- International

Education and Training

- Students
- Postdocs
- Early Career Scientists

Partnerships

- University Nanocenters
- Industrial Partners
- Other Government Agencies

Key Aspects of User Program

- Open, no cost access to facilities based on scientific quality
- Spectrum of user modes
 - Access to equipment
 - Collaborative research
 - Grand Challenge Projects
- External evaluation of proposals
- Special help for first time users
- Mechanisms for proprietary work
- User program jump-start in FY03
- Full operating program in FY06



CINT Time-Line

- **New Construction**
 - **Core Facility & Gateway to Los Alamos**
 - **Currently in design phase**
 - **Construction and equipment purchase complete end of CY2005**
 - **Full operation end of CY2006**

- **User Program**
 - **Jump-Start phase beginning FY2003 (*Now*)**
 - **Ramp to full operation in FY2007**

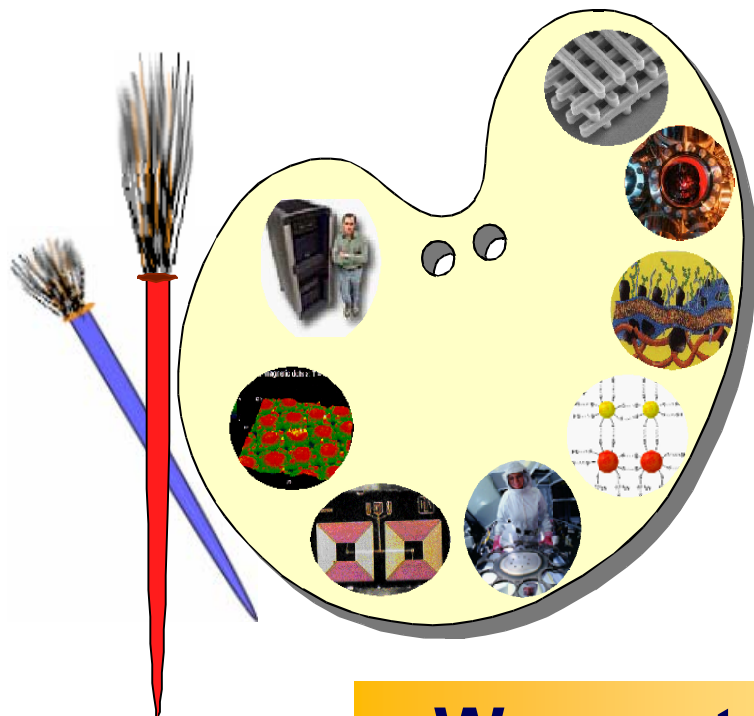


Workshop Purpose

- **Bring you up-to-date on CINT**
 - Thursday a.m presentations
- **Shape CINT's user program and capabilities toward full operation**
 - Thursday p.m. discussions
- **Engage user community in “jump-start” program and begin developing proposals**
 - Friday a.m.



We can make CINT a creative environment for new science and scientist



Moving from “Jump-Start” to Full Operation, your input will be used to develop and refine:

- **Science Directions**
- **Scientific Equipment**
- **User Access Modes**
- **Educational Opportunities**
- **Partnerships**

We want your input

- **Participate in working sessions**
- **Fill out “Feedback Form”**
- **Grab a CINT Scientist (yellow ribbons)**
- **Website comments**

<http://CINT.sandia.gov> or <http://CINT.lanl.gov>